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7590 11/07/2006  
M.P. Williams  
210 Main Street  
Manchester, CT 06040

EXAMINER

SMITH, ZANDRA V

ART UNIT PAPER NUMBER

2822

DATE MAILED: 11/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/783,213

Applicant(s)

FREDETTE, STEVEN J.

Examiner

Christopher J. Clark

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 3 and 6 are objected to because of the following informalities: the term "switches" is applied to what the examiner believes to be two separate sets of switching devices (17 and 34 as explained in the specification). Appropriate correction is required. For the purpose of examination, the examiner considers the first mentioned "switches" (line 2 of Claims 3 and 6) to be separate from the second mentioned "switches" (line 4 of Claim 3 and 6) and the phrase "said switches" (line 5 of Claim 3 and 6) to provide antecedent basis for the second mentioned "switches."
2. Claim 6 is objected to because of the following informalities: the limitations "said auxiliary equipment" and "said critical customer" in Line 7 lack proper antecedent basis. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small (U.S. Patent 4,277,692) in view of Jungreis et al (U.S. Patent 6,134,124).
5. In re Claim 1, Small teaches the following as shown in FIG 1:

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- Three phase power lines (22 and 34, Column 2 Lines 46-48; Shown as one line in the diagram, Lines 48-50 of Column 2 teach that the circuit could be implemented in a three-phase topology)
    - Connected to receive AC power (as seen in the label “A.C. MAINS”)
  - An energy storage device (30, Column 2 Lines 44-45)
  - A bi-directional DC/AC converter (10, Lines 43-44)
    - Connected to energy storage device (through conductors 24 and 26)
    - Connected to three phase power lines (22 and 34)
    - Connected to augment the response of AC power source to transients (Column 9 Lines 60-68 and Column 10 Lines 1-10)
6. Small does not teach a fuel cell power plant delivering DC power to a primary DC/AC inverter to provide AC power to the three phase power lines.
7. Jungreis et al teaches using a fuel cell power plant coupled to a DC/AC inverter in order to produce AC power (Column 3, Lines 44-47).

Small discloses the claimed invention except for the implementation of a fuel cell power plant coupled to a DC to AC inverter to produce AC power. Jungreis et al shows that a fuel cell power plant in combination with a DC/AC inverter is an equivalent power source known in the art (Column 3 Lines 44-47). Therefore, because these two power sources were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a fuel cell power plant with a DC/AC inverter for an AC power source.

8. In re Claim 2, Small teaches the following as shown in Figure 1:

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- Three phase power lines (22 and 34) being coupled to the critical load ("A.C. LOAD" of the figure) through conductors 32 and 34.
- The converter supplying power to a critical customer to avert lapses in power (Column 9 Lines 60-68).

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Small (U.S. Patent 4,277,692) in view of Jungreis et al (U.S. Patent 6,134,124) as applied to Claim 1 above, and in further view of Cratty (U.S. Patent 6,288,456) and Carter et al (U.S. Patent 3,665,495).

10. Small teaches the converter (10) being connected to the three phase lines (22) by switches (40). The examiner would once again like to point out that Small does teach the implementation of a three phase topology for the figure shown (Column 2, Lines 48-50).

11. Small as modified by Jungreis et al has been discussed above, but does not disclose the following:

- The three phase power lines (22) being connected to a power grid by switches
- The converter connected to three-phase power lines by switches which are alternatively connectable to the power grid

12. Cratty teaches the following according to Figure 3, a fuel cell power source (102, Column 2 Line 31) being connected to a utility grid (111, Column 4 Line 51) through switches (B1 and B2, Column 4 Lines 48-49). It should be noted that though character 111 is designated as a switchboard, the switchboard is connected to the power grid (110) as shown in Figure 2A.

13. The advantage of connecting the power grid to the three phase power lines would be to supply non-critical loads with excess power not consumed by the critical loads being supplied by the fuel cell power plant (Column 7 Lines 17-23).

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14. Carter et al teaches the following as seen in Figure 1, a storage device (38, Column 6 Lines 4-5) connected to an AC/DC converter (26 Column 5 Line 7) that is connectable to both the power grid (12 Column 5 Lines 11-12) and three phase lines (lines shown leaving from generator 32) through switches (24, Column 5 Lines 44). Although the converter is not bi-directional, it is still the prime interface between the AC power of the three-phase lines and power grid and the DC power generation of the storage device.
15. The advantage of having the converter alternatively connected between the three phase lines and the power grid through switches is that power delivery may be shifted between the power grid and the fuel cell power plant with power being delivered by the energy storage device between switching to ensure a constant supply of power to a load (Column 5 Lines 44-61). The configuration also allows for the battery to be recharged by either power source (Column 6 Lines 6-9).
16. Small as modified by Jungreis et al discloses the claimed invention except for the three phase lines being connected to a power grid and the converter being alternatively connected between the three phase lines and the power grid through switches. It would have been obvious to one having ordinary skill in the art at the time the invention was made to connect a power grid to the three phase lines as taught by Cratty, since Cratty states that such a modification would supply non-critical loads with excess power not consumed by the critical loads being supplied by the fuel cell power plant (Column 7 Lines 17-23); and further modified with switches capable of making the converter alternatively connectable between the three phase lines and the power grid as taught by Carter et al, since Carter et al states that such a modification would provide power delivery to a critical load to be shifted between the power grid and the fuel cell power plant with

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power being delivered by the energy storage device between switching to ensure a constant supply of power to the load (Column 5 Lines 44-61). The configuration also allows for the battery to be recharged by either power source (Column 6 Lines 6-9).

17. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small (U.S. Patent 4,277,692), in view of Jungreis et al (U.S. Patent 6,134,124), Cratty (U.S. Patent 6,288,456) and Carter et al (U.S. Patent 3,665,495) as applied to claim 3 above, and in further view of Hochgraf et al (U.S. Patent 6,794,844).

18. In re Claim 4, Small as modified by Jungreis et al, Carter et al, and Cratty has been discussed above, but does not teach a diode being connected between the fuel cell power plant and the battery.

19. Referring to Figure 2, Hochgraf et al teaches connecting the fuel cell power plant (24, Column 2 Line 59) to an energy storage device (28, Column 2 Line 60) through a diode (30, Column 2 Line 66). It should be noted that current (and thus power) can only be delivered from the fuel cell power plant to the energy storage device when there is greater voltage on the fuel cell power plant compared to the voltage of the energy storage device based on the known fundamental biasing characteristics of the diode.

20. The advantage of connecting the fuel cell power plant to the energy storage device through a diode is to charge the energy storage device (Column 2 Lines 59-60) as well as to prevent reverse current into the fuel cell device (Column 2 Lines 66-67 and Column 3 Lines 1-2).

21. Small as modified by Jungreis et al, Carter et al, and Cratty discloses the claimed invention except for the diode connected between the fuel cell power plant and the energy

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storage device. It would have been obvious to one having ordinary skill in the art at the time the invention was made to connect a diode between the fuel cell power plant and the energy storage device as taught by Hochgraf et al, since Hochgraf et al states that such a modification would charge the energy storage device (Column 2 Lines 59-60) as well as prevent reverse current into the fuel cell device (Column 2 Lines 66-67 and Column 3 Lines 1-2).

22. In re Claim 6, the converter is capable of supplying power to the critical customer as well as the power grid due to their common connection to the three phase power lines as discussed above. With the fuel cell power plant connected to the energy storage device through a diode, power can be supplied from the fuel cell power plant through the diode to the converter and thus to critical customer and power grid.

23. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Small (U.S. Patent 4,277,692), in view of Jungreis et al (U.S. Patent 6,134,124), Cratty (U.S. Patent 6,288,456), Carter et al (U.S. Patent 3,665,495) and Hochgraf et al (U.S. Patent 6,794,844) as applied to claim 4 above, and in further view of Early et al (U.S. Patent 4,961,151).

24. Small as modified by Jungreis et al, Carter et al, Cratty, and Hochgraf et al has been discussed above but does not teach a switch to interrupt the connection between the fuel cell power plant and the energy storage device.

25. Early et al teaches having a switch (102) to interrupt the connection between the fuel cell power plant (103) and the energy storage device (101) [Column 8 Lines 33-38].

26. The advantage of adding a switch to interrupt the connection between the fuel cell power plant and energy storage device is to prevent the battery from being overcharged (Column 8 Lines 51-55).



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27. Small as modified by Jungreis et al, Carter et al, Cratty, and Hochgraf et al discloses the claimed invention except for the switch to interrupt the connection between the fuel cell power plant and the energy storage device. It would have been obvious to one having ordinary skill in the art at the time the invention was made to connect a switch to interrupt the connection between the fuel cell power plant and the energy storage device as taught by Early et al, since Early et al states that such a modification would prevent the battery from being overcharged (Column 8 Lines 51-55).

### ***Conclusion***

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ohara et al (U.S. Patent 6,215,272) teaches supplying the auxiliary equipment of the fuel cell power plant with power. Luongo et al teaches attaching an energy storage device and AC/DC converter to the power grid.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher J. Clark whose telephone number is 571-270-1427. The examiner can normally be reached on M-F, 7:30-5:00 EST.

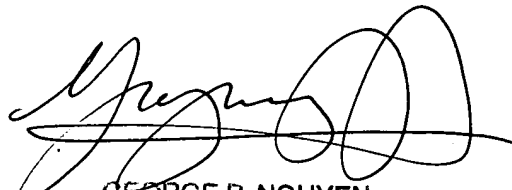
30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on 571-272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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31. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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10/19/2006



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